CLAIMS

What is claimed is:

1   1.   An apparatus for processing data packets, comprising:

2   a first data processing unit adapted to filter incoming packets;

3   an addressable memory unit in which a plurality of instruction sets for packet processing

4   are stored;

5   a second data processing unit adapted to process incoming packets according to one of

6   said plurality of instruction sets; and

7   a data bus connecting the addressable memory unit and the first and second data

8   processing units.

1   2.   The apparatus of claim 1, further comprising a policy condition table connected to said

2   first data processing unit, said policy condition table having a plurality of rules stored therein.

1   3.   The apparatus of claim 1, further comprising a policy action table connected to said data

2   bus and said addressable memory unit, wherein said policy action table stores at least one data

3   processing policy.

1   4.   The apparatus of claim 3, wherein at least one of said policies comprises:

2   a first address pointer element for identifying the location in said addressable memory

3   unit of one of said plurality of instruction sets, and

4   a second address pointer element for identifying the location in said addressable memory

5   unit of a state block.

1   5.   The apparatus of claim 3, wherein said first data processing unit assigns a thread to each

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2   said incoming packet, wherein said thread corresponds to one of said policies stored in said

3   policy action table.

1   6.   The apparatus of claim 5, wherein said first data processing unit comprises logic for

2   matching a first incoming packet to a stored first rule and for generating a first thread if the first

3   incoming packet matches said first rule, said first thread identifying the location of one of said at

4   least one data processing policies in said policy action table.

1   7.   The apparatus of claim 6, wherein said second data processing unit is adapted to process

2   the first incoming packet according to said data processing policy corresponding to said first

3   thread.

1   8.   The apparatus of claim 6, wherein said data processing policy comprises a first address

2   pointer to a starting address of a first set of instructions and a second address pointer to a starting

3   address of a state block stored in said addressable memory unit, said state block used by said first

4   set of instructions for processing the first incoming packet.

1   9.   The apparatus of claim 6, wherein said thread is assigned to said first incoming packet

2   based on said first rule.

1   10.   The apparatus of claim 6, wherein said first processing unit further comprises logic for

2   matching a second incoming packet to a stored second rule and for generating a second thread if

3   the second incoming packet matches the second rule, said second thread identifying the location

4   of one of said at least one data processing policy in said policy action table.

1   11.   The apparatus of claim 10, wherein said second data processing unit is adapted to process

2   the second incoming packet according to said data processing policy corresponding to said

3   second thread.

1   12.   The apparatus of claim 10, wherein said second thread is assigned to said second

2   incoming packet based on said second rule.

1   13.   The apparatus of claim 1, wherein said first processing unit further comprises logic for

2   matching a plurality of incoming packets to a stored corresponding plurality of rules and for

3   generating a thread for each packet that matches one of said plurality of rules, each said thread

4   identifying the location of one of said at least one data processing policy in said policy action

5   table.

1   14.   The apparatus of claim 13, wherein the second data processing unit is adapted to process

2   each packet according to said data processing policy corresponding to said thread associated with

3   said packet.

1   15.   The apparatus of claim 13, further comprising a memory unit connected to said first data

2   processing unit and to said second data processing unit, said memory unit adapted to temporarily

3   store packets before processing by said second data processing unit.

1   16.   The apparatus of claim 1, wherein said second data processing unit comprises a plurality

2   of general purpose processors for executing instructions in parallel.

1   17.   The apparatus of claim 16, wherein at least one said general purpose processor comprises

2   a complex instruction set computer processor.

1   18.   The apparatus of claim 16, wherein at least one said general purpose processor comprises

2   a reduced instruction set computer processor.

1   19.   A method for processing data packets, comprising:

2   receiving a first incoming packet;

3   determining whether to admit the first incoming packet;

4   assigning a first thread to the first incoming packet if said first incoming packet is

5   admitted, wherein said first thread points to a stored policy; and

6   processing the first incoming packet according to said stored policy.

1   20.   The method of claim 19, wherein said stored policy comprises a first address pointer

2   pointing to the location of a first set of instructions, and wherein said processing step utilizes said

3   first set of instructions to process said first incoming packet.

1   21.   The method of claim 20, wherein said stored policy further comprises a second address

2   pointer pointing to the location of a state block, and wherein said processing step utilizes said

3   state block to process the first incoming packet.

1   22.   The method of claim 19, further comprising the step of storing at least one policy in a

2   policy action table.

1   23.   The method of claim 22, further comprising the step of updating said policy action table.

1   24.   The method of claim 19, wherein said determining step further comprises searching a

2   policy condition table for a rule corresponding to the contents of the first incoming packet.

1   25.   The method of claim 19, further comprising the step of placing the first incoming packet

2   in a processing queue after said assigning step and before said processing step.

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1 26. A method for processing data packets, comprising:

2 receiving a packet; *(N)*

3 comparing the packet to one or more stored rules; and

4 discarding the packet unless the packet matches a rule allowing the packet to be admitted.

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